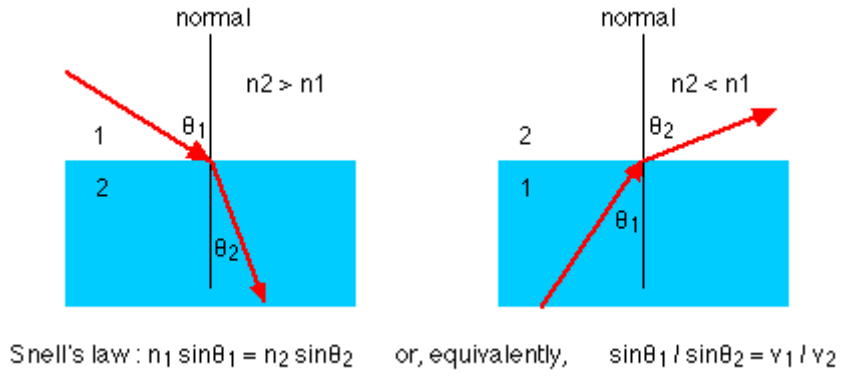
Refraction

- When a wave passes from one medium to another medium, it may change speed, wavelength and direction; frequency does not change. There may also be some reflection; note that whenever a wave passes through a boundary the wave may lose energy, usually to heat. The change in speed/wavelength and direction can be found from Snell's Law; note that the wave bends towards the normal when travelling to a denser media, and away from the normal when travelling to a less dense media. Refraction can also occur when the properties of the media change.



Snell's law : $n_1 \sin\theta_1 = n_2 \sin\theta_2$ or, equivalently, $\sin\theta_1 / \sin\theta_2 = v_1 / v_2$

Light Travelling from a Fast to a Slow Medium

If a ray of light passes across the boundary from a material in which it travels fast into a material in which travels slower, then the light ray will bend towards the normal line.

Light Travelling from a Slow to a Fast Medium

If a ray of light passes across the boundary from a material in which it travels slowly into a material in which travels faster, then the light ray will bend away from the normal line.

Snells Law

$$n_1 \sin\theta_1 = n_2 \sin\theta_2$$

$$\frac{n_1}{n_2} = \frac{v_2}{v_1} = \frac{\lambda_2}{\lambda_1}$$